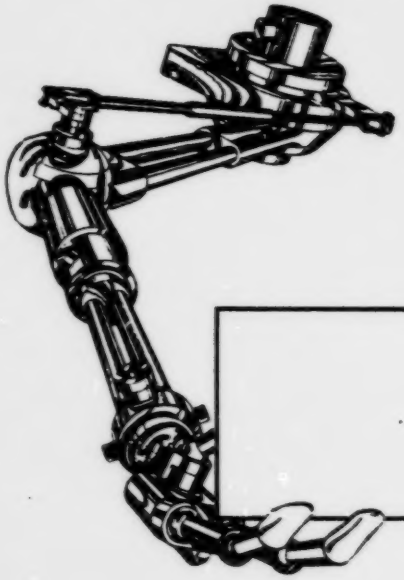
THE HUMAN RESOURCE IMPLICATIONS OF TECHNOLOGICAL CHANGE IN THE PRINCE EDWARD ISLAND MANUFACTURING INDUSTRY



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The Human Resource Implications of Technological Change in the Prince Edward Island Manufacturing Sector.

A study conducted jointly by the Labour Market Programs Branch, Canada Employment and Immigration Commission, P.E.I. Region; and the Human Resource Development Division, Department of Industry, Province of P.E.I.

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EXECUTIVE SUMMARY

In the summer of 1983, the Canada Employment and Immigration Commission, P.E.I. Region, and the Department of Labour, Province of P.E.I.[1] jointly conducted a survey of manufacturing companies in the province. The purpose of the survey was to identify changing trends in manufacturing sector employment, and the implications of such changes for Federal and Provincial labour market programs. Particular attention was paid to the impact which technological change is having, or is likely to have on employment patterns in the manufacturing sector.

The 1983 Survey covered 78 companies who were primarily engaged in processing or secondary manufacturing activities in P.E.I. The Survey was conducted through personal interviews with a senior representative of each company. The 78 firms represented approximately 25% of all manufacturing sector firms in 1983, but accounted for approximately 75% of all manufacturing employment at that time.

Historically, the manufacturing labour force in P.E.I. experienced its strongest growth during the 1970's. In the period 1971 to 1981 the secondary manufacturing labour force grew by 53.3% and the processing labour force increased by 33%. The 1981 Census shows an increase of 1,620 persons in the manufacturing labour force in comparison to 1971. The occupational groups benefiting the most from this growth were production line workers (especially in fish processing), labourers, accounting clerks, and management occupations.

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1 The Human Resource Development Division of the Department of Labour which co-sponsored the Survey, is now located in the Department of Industry.

The major findings of the 1983 Survey were as follows:

By the summer of 1983, the survey companies had regained and exceeded their pre-recession employment levels (although this was not true for the sector as a whole). The strongest upswing was experienced in the processing sector. The occupational profile of the survey companies shows 65% of their total labour force engaged in processing occupations, and 25% in machining, construction trades, and product fabricating. 13% of the survey companies reported experiencing problems with staff turnover, while 23% stated that they had job vacancies open during a specified week. The range of unfilled vacancies was extensive, although the majority were in the medium to high skill categories. A significant number of companies indicated that they recruited outside of P.E.I. for management and professional positions, and in some cases for skilled tradesmen.

As might be expected, technological change was not found to have had a major impact to date on manufacturing sector employment in P.E.I. Forty (40) of the seventy-eight (78) survey companies reported some form of recent technological change in their office or production equipment, but in most cases this represented improved versions of existing technologies. Fifteen (15) companies reported that they were currently using computers of various kinds, and five (5) were using word processors. A higher proportion of Food and Beverage Processors than secondary manufacturers reported the installation of improved equipment, but the latter group were better represented in micro-electronic equipment purchases. In-house training was the method used by the majority of companies in order to meet any new skill requirements

arising from the equipment change. Of the 15 companies reporting the current use of computers, only one company had hired from outside the firm. Seven (7) of the thirty one (31) companies installing new production equipment indicated that the new equipment would result in reduced labour costs.

Fifty-two (52) of the seventy-eight (78) survey companies indicated that they would be installing new equipment within the next three years. The majority of those companies anticipated that such changes would affect the kind of work performed. Twenty-two (22) companies anticipated that existing staff would require re-training, while thirteen (13) companies thought that new hirings would result. Only two (2) firms anticipated job losses as a result of the installation of new equipment.

The major factors, other than new technology, which are expected to influence employment levels over the next three years are economic conditions, supply and demand, and the availability of new markets. The majority of companies anticipated little change in employment levels over the next few years, while only three (3) expected a decline. The estimates of future employment provided by the Survey firms indicate that secondary manufacturers will show the strongest employment growth, while processing companies will continue to account for the major slice of sectoral employment. Overall growth will proceed at a slower rate than that experienced during the 1970's.

The occupational profile of the P.E.I. manufacturing sector is unlikely to change to any significant degree over the next few years. The addition of new companies, the closure of existing companies, or changes in the products produced will be far more important determinants of labour demand than the adoption of new technologies. However a small, but increasing number of companies are planning to introduce computerized office and production equipment, which will result in a reduced requirement for semi-skilled production workers and an increased requirement for computer operators, electronic and engineering technologists and technicians.

INTRODUCTION

During the months of July and August 1983, CEIC. (P.E.I. Region) and the Department of Labour[1], Province of P.E.I. conducted a joint survey of manufacturing companies in Prince Edward Island. The survey instrument (see Appendix A) was used to obtain information from 78 selected employers, who were visited in person by members of the study team. The purpose of the survey was to identify changing trends in employment in manfacturing, and the implications of such trends for Federal/Provincial labour market programs. Of particular interest were changes in the industry's human resource requirements resulting from the installation of new equipment where this affected employment levels, and/or the occupational profile of a company's workforce. In light of the national debate on the likely employment impact of technological change, a major objective of the survey was to determine the extent to which Island manufacturing companies are adopting new technologies, and their effect upon the kind of work performed.

The survey design was largely determined by the needs of both levels of government for better information on employment trends in P.E.I. Such information is required for long term planning in relation to labour market programs, and more specifically for ensuring that training funds are directed towards occupational areas in future demand. It is now generally recognized that in a climate of continuing high unemployment better planning by both industry and government is essential to labour market adjustment. Industry needs

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1 The Human Resource Development Division of the Department of Labour which co-sponsored the Survey is now located in the Department of Industry.

workers with the required skills at the right point in time, while government has a responsibility to ensure that individuals do not remain unemployed while jobs for which they might qualify given sufficient information and training remain unfilled. The pace of technological innovation in industry, and the resulting changes in skill requirements renders the need for improved information more urgent.

This report presents the findings of the 1983 survey, and relates them to historical and projected employment trends. The report itself is divided into four sections. The first section "Historical Labour Force and Employment Trends in Manufacturing" sets the stage for the intepretations of survey results by describing occupational and employment trends in the period 1971 to 1983. The following section presents the findings of the 1983 survey, and includes both descriptive information on the survey companies and forward-looking information on technological change, employment, and occupational skills in demand. The final sections entitled "Estimates of Future Employment Levels in Manufacturing" and "Human Resource Development Issues" attempt to summarize and draw conclusions from the survey data and other statistical sources in order to provide information useful to both government and industry.

It is hoped that the production of a report of this nature will lead to increased dialogue between industry and government in P.E.I. on employment issues, and that through such dialogue information can be updated and errors corrected. Comments on the report itself, and in particular the estimates of future employment levels and skill requirements in the final sections would be greatly appreciated by the Federal and Provincial Study Coordinators.

METHODOLOGY

In the selection of firms to be included in the survey three factors were considered important. Firstly, the sample was chosen to reasonably reflect all major industry sub-groups within the manufacturing sector. Secondly, an attempt was made to include all major employers, defined as those with 50 or more employees. Thirdly, as many secondary manufacturers as possible were included, because of the emphasis of the survey upon the impact of technological change. It was thought that while the food and beverage processing sector was most significant in terms of employment, secondary manufacturers might be of greater interest in regard to the implementation of new technologies. The effect of these three factors is to bias the sample towards the larger firms, with processors slightly under-represented (relative to their employment levels) and secondary manufacturers slightly over represented. Of the total of 78 companies included in the survey, 31 were engaged in processing activities, and 47 in secondary manufacturing. These 78 companies represented 25% of all firms in the P.E.I. manufacturing sector at the time of the survey (July and August 1983)[1] but accounted for approximately 75% of manufacturing sector employment.

Appendix B provides the list of firms which were included in the survey.

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1 - According to the Market Development Centre, Trade Directory.

HISTORICAL LABOUR FORCE & EMPLOYMENT TRENDS IN MANUFACTURING

In this section the historical contribution of different manufacturing sub-sectors to employment growth in P.E.I. is examined in order to place the 1983 Survey findings in perspective. By identifying industry and occupation trends, and comparing these trends to the findings of the 1983 Survey, it will be possible to come to a preliminary assessment of future employment opportunities in the final sections of the report.

Manufacturing activity in Prince Edward Island falls into two distinct categories, food and beverage processing and secondary manufacturing. The food and beverage industry dominates the sector, and accounted for 70.5% of the manufacturing labour force in 1981. It includes several of the Island's largest private sector employers, and is geographically scattered. By contrast, secondary manufacturing in Prince Edward Island tends to be concentrated in the urban centres of Charlottetown and Summerside, and covers a wide range of activities. Company size is on average smaller than in the food and beverage processing sub-sector. The most significant (in terms of employment) secondary manufacturing activities on the Island are wood industries, printing and publishing, ship and boat building, metal fabricating, chemical and chemical product industries.

In the period 1971 to 1981 the manufacturing sector made a considerable contribution to labour force growth in the Province. At the time of the 1971 Census the manufacturing labour force numbered 4,205. By 1981 it had grown to 5,825, an increase of 38.5%. In comparison, the total labour force in P.E.I. increased by 32.8% in the same period. Table 1 shows the size of the labour force for the major components of the manufacturing sector in 1971 and 1981.

TABLE 1 LABOUR FORCE BY TYPE OF MANUFACTURING ACTIVITY - P.E.I.

Industry	Labour Force 1971	Labour Force 1981	Increase/ Decrease	Percentage Change
Meat & Poultry Products	280	365	85	30.4
Fish Products	1620	2460	840	51.9
Fruit & Vegetable Processing	490	345	-145	-29.6
Dairy Products	355	365	10	2.8
Flour & Breakfast Cereal Products	5	15	10	200.0
Feed Industry	105	115	10	9.5
Bakery Products	110	130	20	18.2
Miscellaneous Food Industries	25	225	200	800.0
Beverage Industries	75	50	-25	-33.3
TOTAL FOOD & BEVERAGE	3060	4070	1010	33.0
Textile Industries	60	65	5	8.3
Clothing Industries	-	95	95	-
Wood Industries	325	375	50	15.4
Furniture & Fixtures	15	30	15	100.0
Printing, Publishing	165	240	75	45.5
Metal Fabricating Industries	110	190	80	72.7
Machinery Industries	50	90	40	80.0
Transportation Equipment Industries	95	190	95	100.0
Non-Metallic Mineral Products	35	105	70	200.0
Chemical & Chemical Products	150	140	-10	-6.7
Miscellaneous Manufacturing Industries	25	100	75	300.0
Other*	90	135	45	50.0
TOTAL SECONDARY MANUFACTURING	1145	1755	610	53.3
TOTAL	4205	5825	1620	38.5

* Other - Includes all Industry groups of minor employment significance.

Source: 1981 Census of Canada Catalogue 92-925

NOTE: Totals Based on Unrounded Data

During the 1970's, the secondary manufacturing labour force grew at a faster pace than the processing labour force. Their respective growth rates in the period 1971 to 1981 were 53.3% and 33%. This was due in large part to efforts made under the Canada/P.E.I. Development Plan to attract manufacturing industries to the Island, and the provision of necessary infrastructure such as Industrial Park facilities. In the processing sub-sector, the greatest expansion occurred in fish processing, with the establishment of the 200 mile limit encouraging increased processing activities in P.E.I. The considerable efforts made to develop new products and increase the value added to finished products also encouraged labour force growth. The dramatic rise in the miscellaneous processing category is largely accounted for by activities related to the processing of Irish Moss. The fruit and vegetable processing category shows a substantial decline during this period, as does the beverage industry.

At the time of the 1981 Census, manufacturing industries accounted for 11% of all jobs in Prince Edward Island. In the following year the onset of the economic recession caused employment levels in manufacturing to fall from 5,380 in June 1981 to approximately 3,000 by June 1982. The closure of the Georgetown Seafoods Plant, Roadrunner Jeans in Charlottetown, Belrive Fashions in Summerside, and reduced operations elsewhere in the industry caused dramatic reductions in employment. In 1983 some of these losses were regained. The closure of all but a kill and chill operation at Canada Packers in that year was offset by increased hirings by food processing companies, and the opening of several small manufacturing firms in the West Royalty Industrial Park. In June 1983 employment in manufacturing had risen to approximately 4,000.[1]

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[1]According to the Labour Force Survey, Statistics Canada CAT #71-001

Growth in the manufacturing sector labour force in the period 1971 to 1981 also caused a rearrangement of the industry's occupational profile. Some occupations listed in the 1971 Census such as coopers, and street vendors had disappeared from the list of manufacturing sector occupations by the time of the 1981 Census. A considerably larger list of new occupations appeared in 1981, among them sales and advertising managers (45), electronic data processing equipment operators (25), patternmakers-textiles (25), and mechanical engineers (15). Table 2 compares the 1971 and 1981 labour force in manufacturing for selected occupations. (Includes all occupational categories with over 45 persons in 1981 labour force.)

During the 1970's the occupational categories in the manufacturing sector experiencing the strongest growth rates fell into three broad categories. Firstly, those occupations which were closely associated with a growth sub-sector increased in importance. Examples are production workers in fish processing, welders in metal fabricating and machinery products, and sewing machine operators in the clothing industry. The second category consists of occupations common to many industry sectors which benefited from the overall increase in manufacturing sector employment. Examples in this group are labourers, office clerks, secretaries, truck drivers, and bookkeepers. The third group consists of highly skilled or professional occupations which grew in size partially as a result of overall growth, but also due to the increasing sophistication of the industry during this period. The number of production managers, for example, increased from 5 in 1971 to 125 in 1981. Purchasing officers and dietitians also grew in number.

Another occupation experiencing dramatic growth, Inspecting, Testing, and Grading, does not quite fall into either of the three categories outlined above. This occupation increased its labour force from 70 in 1971 to 200 in 1981, no doubt due to an

TABLE 2 Occupational Profile of the Manufacturing Sector - P.E.I.

Occupation	Labour Force 1971	Labour Force 1981	Increase/ Decrease	Percentage Change
Production Management Occupations	5	125	120	2,400.0
Purchasing Officers & Buyers	30	50	20	66.7
Dietitians & Nutritionists	40	65	25	62.5
Secretaries & Stenographers	30	50	20	66.7
Bookkeeping & Accounting Clerks	60	125	65	108.3
Weighers	65	65	-	-
General Office Clerks	40	50	10	25.0
Commercial Travellers	40	60	20	50.0
Salesmen & Salespersons, Commodities	50	55	5	10.0
Fishermen: Net, Trap & Line	110	220	110	100.0
Fishing, Hunting, Trapping & Related	5	50	45	900.0
Foreman, Food, Beverage and Related Processing	175	100	-75	-42.9
Slaughtering & Meat Cutting, Canning	140	150	10	7.1
Fish Canning, Curing & Packing Occ.	915	1250	335	36.6
Fruit, Vegetable Canning, Preserving	65	105	40	61.5
Milk Processing Occupations	30	65	35	116.6
Inspecting, Testing, Grading and Sampling	70	200	130	185.7
Occup. in Labouring & Other Elemental Work	300	540	240	80.0
Welding & Flame Cutting Occup.	40	95	55	13.7
Sewing Machine Operators, Textile	15	65	50	333.3
Industrial, Farm & Construction Machinery	50	50	-	-
Truck Drivers	110	140	30	27.3
Longshoremen, Stevedores and Freight Handlers	30	50	20	66.7
Material Handling Equipment Oper.	80	75	-5	-6.2
Packaging Occupations	85	100	15	17.6
Not elsewhere classified	50	100	50	100.0

Source: 1971 & 1981 Census of Canada - Tabulations prepared for the Canadian Occupational Projection System C.E.I.C.

increased concern with quality control as markets expanded. It may also be an occupational category highly susceptible to technological change in the 1980's.

To recapitulate, the major trends in manufacturing employment during the 1970's, as identified from Census data were as follows:-

1. Strongest growth rates occuring in secondary manufacturing
2. Increases in fish processing employment accounting for the bulk of processing sector growth.
3. Industry expansion resulting in increased occupational demand for production line workers.
4. Strong growth occurring in management and professional occupations.

THE 1983 SURVEY

THE 1983 SURVEY

BACKGROUND INFORMATION ON THE SURVEY COMPANIES

The following section of the report will summarize information from the survey pertaining to background information on the firm (year opened, year round or seasonal operation of the firm, head office location), employment levels (from 1979-1983), occupational structure, products, employment levels by industry, primary markets, employers' experience with turnover, vacancies and recruitment patterns.

This will be followed by a summary of manufacturing employment trends.

AGE OF COMPANIES

Year opened - Firms were asked to indicate the year the firm opened on Prince Edward Island (regardless of whether or not the name changed). Interestingly enough, half of the firms had opened prior to 1964. However, 33 of the 78 firms (42%) in the survey had opened since 1970 compared to 7 firms in the 1960's.

Clearly, some of the firms are relative newcomers to the manufacturing industry which suggests entrepreneurs in the past decade have identified feasible business opportunities.

SEASONALITY

The vast majority of firms (88%) are open on a year round basis, however, there is fluctuation in the employment levels during the year. Only nine of the firms operate on a part-year basis. Most (6) reopen in April and close in either November (3) or December (3).

There are, however, other variations in the months of operation depending on the industry. For example, one firm opened in May while another opened in August. Some firms closed in May, September and October.

HEAD OFFICE LOCATION

As one might expect, the majority (89%) had their head offices on Prince Edward Island while only nine firms reported a head office outside the province. The survey of employers conducted by the Prince Edward Island Department of Labour in 1981 found a similar percentage of firms (87%) with head offices on Prince Edward Island.

Given that most have head offices on Prince Edward Island, this would seem to suggest the firms are locally owned and operated and consequently would employ approximately 87% of workers. However, those firms with head offices outside of the province accounted for 27% of those employed during the peak month of 1983. Thus although only 11% of those firms in the survey were owned outside the province, the firms accounted for a disproportionate share of employment. The following section provides additional information on employment levels.

MANUFACTURING EMPLOYMENT LEVELS

Although there were only nine firms that closed down for a period of time during the year, the majority of firms operating on a year round basis experienced seasonal fluctuations in employment levels. In total, 59% (or 46 firms) indicated employment in the firm fluctuated on a seasonal basis; the remaining 32 firms had a consistent level of employment throughout the year. To assess the two different patterns of employment (seasonal variation and a consistent level), each were asked different questions.

Those who reported a seasonal pattern of employment were asked their employment levels during the peak and the low month each year since 1979. For those who reported a consistent level of employment, they were asked to provide their levels of employment from 1979 to 1983.

Table 3 presents the levels of employment for peak and low months as well as year-round employment.

TABLE 3 - EMPLOYMENT LEVELS: 1979 - 1983

YEAR	A PEAK MONTH EMPLOYMENT	B LOW MONTH EMPLOYMENT	C YEAR ROUND EMPLOYMENT	D[1] PEAK MONTH TOTAL EMPLOYMENT (PEAK+YEAR ROUND)	E[2] LOW MONTH TOTAL EMPLOYMENT LOW+YEAR ROUND
1979	2,284	2,106	725	3,009	2,831
1980	2,225	2,028	733	2,958	2,761
1981	1,014	743	765	1,779	1,508
1982	981	676	817	1,798	1,493
1983	2,997	946	799	3,796	1,745

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Questions 7-8.

1. Peak month total employment is equal to peak month (Column A) + year round (Column C).

2. Low month total employment is equal to low month (Column B) + year round (Column C).

Clearly, there has been signficant variation in employment levels. During the economic recession in 1981-1982, total employment declined by almost 1,300. However, after the recession in 1983, employment exceeded the 1979 and 1980 levels by approximately 800.

One interesting trend is that year round employment has remained fairly constant, while seasonal employment has fluctuated from 1,000 to 3,000 between 1982 and 1983.

The question is, why the tremendous variation? One possible answer is that during the economic recession manufacturers unable to sell their products, laid people off because of a growing inventory. In 1983, when their inventories were depleting, manufacturers hired staff back on in order to meet the demand for their products.

OCCUPATIONS

Employers were asked to identify the jobs that are involved in the production of their products as well as the number of individuals working in jobs. The jobs were then coded based on the Canadian Classification and Dictionary of Occupations system (CCDO).

The following table presents employment by occupation at the two digit level:

TABLE 4 - EMPLOYMENT BY OCCUPATION, SUMMER OF 1983

OCCUPATION	NUMBER	PERCENT
Managerial, Administrative, and related	146	5.1
Natural Sciences, Engineering, Math	43	1.5
Teaching and Related	2	.07
Artistic, Literary, Performing Arts and Related	41	1.4
Clerical and Related	175	6.1
Sales Occupation	103	3.6
Service	3	.1
Farming	34	1.2
Fishing	60	2.1
Processing	1,290	45.1
Machining and Related	289	10.1
Product Fabricating, Assembling and Repairing	235	8.2
Construction Trades	231	8.1
Transport Equipment Operating	71	2.5
Material Handling and related	65	2.3
Other Crafts and Equipment Operating Occupations	67	2.3
Occupations, Not elsewhere classified	1	.03
TOTAL	2,856	

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 9

The majority of those employed in the manufacturing industry were in the processing occupations. Approximately 26% of those employed were in machining, construction trades and product fabricating occupations.

Approximately 6% were in clerical occupations and 5% in managerial. Only a fraction of those employed in the manufacturing industry are in the natural sciences, (systems analyst), artistic (e.g. writers and editors) transport equipment (e.g. truck drivers), and sales occupations.

The occupational structure of a firm is, of course, dependent on the nature of the product manufactured For example a firm that makes signs would have a completely different occupational profile as compared to a fish processing plant. However, regardless, of the products, most firms need to have persons employed in managerial, clerical and indeed sales occupations.

Machining, product fabricating and the construction trades occupations also account for a portion of employment. These employees are responsible for making the products or maintaining the equipment.

Appendix C presents the detailed listing of the number employed by four digit occupation.

TYPE OF INDUSTRY

Employers were asked to indicate the type of products they manufactured. Prior to the interview, the interviewer listed the firm's products based on the Market Development Centre's Trade Directory.

Firms were asked to provide any corrections to the list.

Table 3 presents the number of firms by Standard Industrial Classification (SIC). It should be mentioned that the SIC was coded on the basis of the various products produced. Thus firms could produce a variety of different products which explains why the total exceeds the number of firms.

TABLE 5 - NUMBER OF FIRMS BY TYPE OF INDUSTRY

INDUSTRY	NUMBER	PERCENTAGE
Logging	1	0.9
Meat and Poultry Products Industry	4	3.0
Fish Products Industry	15	13.0
Fruit and Vegetable Processing Industries	4	3.0
Dairy Products Industry	5	4.0
Flour and Breakfast Cereal Products Industry	1	0.9
Feed Industry	2	2.0
Bakery Products Industries	1	0.9
Beverage Industries	1	0.9
Plastics Fabricating n.e.s.	3	3.0
Luggage, Handbag and Small Leather Goods Manufacturing	1	0.9
Wool Yarn and Cloth Mills	1	0.9
Canvas Products, and Cotton and Jute Bags	1	0.9
Knitting Mills (except hoisery)	1	0.9
Miscellaneous Clothing Industries	2	2.0
Sawmills, Planing Mills and Shingle Mills	4	3.0
Wooden Box Factories	2	2.0
Household Furniture Manufacturers	3	3.0
Office Furniture Manufacturers	1	0.9
Commercial Printing	4	3.0
Publishing and Printing	3	3.0
Iron Foundries	1	0.9
Copper and Copper Alloy Rolling, Casting and Extruding	1	0.9
Boiler and Plate Works	1	0.9
Fabricated Structural Metal	3	3.0
Ornamental and Architectural Metal	4	3.0
Metal Stamping, Pressing and Coating	2	2.0
Hardware, Tool and Cutlery Manufacturers	1	0.9
Heating Equipment Manufacturers	1	0.9
Machine Shops	4	3.0
Miscellaneous Metal Fabricating	4	3.0

TABLE 5 (CONTINUED)

INDUSTRY	NUMBER	PERCENTAGE
Agricultural Implement	1	0.9
Miscellaneous Machinery and Equipment Manufacturers	5	4.0
Office and Store Machinery Manufacturers	1	0.9
Aircraft and Aircraft Parts Manufacturers	1	0.9
Shipbuilding and Repair	2	2.0
Boatbuilding and Repair	2	2.0
Manufacturers of Light Fixtures	1	0.9
Communications Equipment Manufacturers	2	2.0
Manufacturers of Electrical Industrial Equipment	1	0.9
Manufacturers of Miscellaneous Electrical Products	1	0.9
Stone Products	1	0.9
Concrete Products Manufacturers	2	2.0
Ready-Mix Concrete Manufacturers	2	2.0
Manufacturers of Mixed Fertilizers	1	0.9
Paint and Varnish Manufacturers	1	0.9
Miscellaneous Chemical Industries	1	0.9
Scientific and Professional Equipment Industries	1	0.9
Sporting Goods and Toy Industries	1	0.9
Signs and Display Industry	1	0.9
Miscellaneous Manufacturing Industries	2	2.0
Wholesalers of Farm Products	1	0.9
Food Stores	1	0.9
Gasoline Service Stations	1	0.9

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 10

Clearly, Prince Edward Island's manufacturing industry is diversified, however, the major concentration of firms is in the food and beverage industries. Island manufacturers are involved in a broad range of different products such as shipbuilding, printing, fertilizers, signs and communications equipment.

EMPLOYMENT LEVELS BY INDUSTRY

Employment levels, however, vary by industry .

Table 6 presents employment levels over the last several years by industry. The industry coding is based on the first products listed which is assumed to be the firms major product.

Clearly, there has been significant variation in employment especially during 1981 and 1982. Employment in the fish products industry declined substantially in 1981 and 1982, probably as a result of the closure of Georgetown Seafoods and cutbacks in other plants.

It is obvious that the recession impacted on employment as most industries recorded either small or significant declines in employment during 1981 and 1982. By 1983, some industries had attained their pre recession employment levels. It is encouraging to note that peak employment levels in 1983 are higher than each of the years since 1979.

In summary, most industries experienced declining employment during 1981 and 1982, which has rebounded in 1983. It is readily apparent that various industries experience tremendous fluctuations in employment during the year. The seasonal variation results from the nature of the product and the seasonal demand.

TABLE 6 - EMPLOYMENT LEVELS BY INDUSTRY

INDUSTRY	SIC	1979 LOW	1979 PEAK	1980 LOW	1980 PEAK	1981 LOW	1981 PEAK	1982 LOW	1982 PEAK	1983 LOW	1983 PEAK
Meat and Poultry	101	9	14	9	14	9	14	9	14	7	12
Fish Products	102	1074	1159	1171	1242	185	267	188	267	213	1393
Fruit and Vegetable Processing	103									200	450
Dairy Products	104	60	80	80	60	75	100	75	100	75	100
Bakery Products	107	10	14	10	14	10	14	10	14	10	14
Beverage Industries	109	49	48	50	51	39	38	41	40	41	51
Plastics Fabricating	165	19	23	21	25	19	26	18	25	18	33
Canvas Products & Jute Products	187	51	51	51	51	40	40	40	40	40	51
Natural Fibres Processing	191	19	22	19	22	14	22	19	22	19	22
Knitting Mills	239	118	16	13	19	15	12	6	10	7	16
Sawmills	251	28	56	24	42	18	40	17	32	14	28
Sash Door and Other Millwork	254	108	160	98	145	73	115	48	115	71	170
Household Furniture	261	15	12	13	13	5	4	5	5	5	35
Commercial Printing	286	15	18	16	19	17	20	18	21	18	21
Ornamental and Architectural	303	210	210	210	210	48	48	48	48	42	208
Metal Stamping	304	15	15	15	15	8	8	8	8	25	35
Heating Equipment Manufacturers	307	4	6	4	6	4	6	4	6	4	6
Machine Shops	308	34	93	34	93	38	95	38	95	38	95
Boatbuilding and Repair	328	18	15	15	15	6	6	6	6	6	15
Stone Products	353	1	9	1	9	1	9	1	9	1	9
Concrete Products	354	132	144	82	94	67	79	32	54	42	94
Mixed Fertilizers	372	40	40	40	40	40	7	7	7	7	40
Paint and Varnish	375	7	9	7	9	7	9	7	9	7	9

TABLE 6 - EMPLOYMENT LEVELS BY INDUSTRY

INDUSTRY	SIC	1979 LOW	1979 PEAK	1980 LOW	1980 PEAK	1981 LOW	1981 PEAK	1982 LOW	1982 PEAK	1983 LOW	1983 PEAK
Sporting Goods	393	40	40	40	40	20	20	20	20	20	40
Signs and Displays	397	7	10	7	10	7	10	7	10	7	10
Farm Products	602	25	20	25	40	5	5	4	4	4	40
TOTAL		2106	2284	2128	2225	742	1014	676	981	946	2297

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 8, 10

TURNOVER

Employers were asked "over the past 12 months, has turnover (people leaving as a result of quitting or being fired) been a problem in your establishment?" Only six (or 8%) of employers indicated it had been a problem for them (In the 1981 Employers Survey 18% of all employers in the survey reported turnover problems). Employers were then requested to list the jobs where turnover was a problem.

The following table presents the list of occupations as well as the number of firms indicating turnover was a problem.

TABLE 7 - OCCUPATIONS WHERE EMPLOYERS REPORTED TURNOVER WAS A PROBLEM

OCCUPATION	NUMBER OF FIRMS REPORTING A PROBLEM
Shipping and Receiving Clerk	1
Labourers: Metal Processing	1
Fish Canning, Curing and Packing	2
Fruit and Vegetable Canning	1
Inspector: Food Beverage related	1
Machine Tool Operating	1
Electrical and Related Equipment Installing	1
Electronic Equipment Fabricating	1
Labouring: Product Fabricating, Assembling & Repair	1
TOTAL	10

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 33

Turnover can of course be a result of a number of factors, low pay, poor working conditions and a lack of job satisfaction.

Although some low skill occupations were a turnover problem (shipping and receiving clerk, fish canning and fruit and vegetable canning), the high skill occupations would seem to represent more of a recruitment difficulty for employers.

It is not possible to determine why the occupations are a problem, nonetheless it does pinpoint that generally the turnover problems are not in management, sales or clerical staff but rather in some skilled occupations such as machine tool operating, electrical and related equipment installing.

"Pirating" or one firm offering a skilled employee more money to come to their firm is another plausible reason for turnover problems. If it is a problem, then employers are faced with increasing salaries in order to avoid losing valuable trained employees.

In general, turnover was not a problem for most firms.

Information was also obtained on job vacancies.

JOB VACANCIES

In order to ensure consistent data on job vacancies, employers were asked "During the week of July 4 - July 8, 1983, did you have any jobs open?" Surprisingly 18 firms (23%) reported job vacancies. In the 1981 Prince Edward Island Employers Survey only 6% reported a job vacancy. The vacancies could be as a result of the increasing employment in the manufacturing industry after the recession. Once again, employers were asked to identify the types of jobs which were open.

TABLE 8 - NUMBER OF FIRMS REPORTING JOB VACANCIES BY OCCUPATION

OCCUPATION	NUMBER OF FIRMS
Management Occupations	1
Physical Sciences, Technologists and Technicians	1
Draughtsmen	2
Tellers and Cashiers	1
Shipping and Receiving Clerk	1
Collectors	1
Sales Occupations	1
Labourer: Metal Processing	1
Baking, Confectionary and Related	1
Milk Processing	1
Labouring: Wood processing	1
Wood Processing Occupations	1
Machine Tool Operating	1
Welding and Flame Cutting	1
Marine Craft Fabricating and Assembling	1
Labourer: Product Fabricating Assembling and Repairing	2
Glazier	1
Labouring: Construction Trades	1
Other Construction Trades	2
Printing Press Occupations	1
TOTAL	23*

* Some firms may have listed more than one occupation

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 34

Clearly, there was a broad range of jobs open during the first week of July, 1983. Jobs from management to labourer were open.

However, it is apparent that most of the jobs that were available tended to be medium to high skill jobs (machine tool operating, glazier, marine craft fabricating). Job vacancies (as well as turnover) can result because of poor pay, poor working conditions, normal turnover or because of a lack of skilled workers.

Once again, it is difficult to assess why there were job vacancies, nonetheless, it does illustrate that manufacturers had job available at the medium to high skill level.

RECRUITMENT PATTERNS

In an effort to understand how firms recruit their employees, employers were asked to identify positions usually filled by - a) internal promotion; b) hiring outside the firm and c) hiring outside the Province.

Most firms (49) utilized internal promotion and/or hiring outside the firm (46). Indeed, 27 firms reported hiring outside the Province. One of the key indicators of training needs within the Province could be those positions where hiring out of province occurs.

The following table identifies those positions for which employers recruited outside the province.

TABLE 9 NUMBER OF FIRMS HIRING OUTSIDE THE PROVINCE BY OCCUPATION

OCCUPATION	NUMBER OF FIRMS	SUBTOTAL
MANAGERS		
General Managers	9	
Management Occupations, Natural Sciences	1	12
Personnel and Industrial Relations Management	1	
Production Management	1	
NATURAL SCIENCES		
Chemists	1	
Industrial Engineer	2	
Mechanical Engineer	1	7
Draughtsmen	2	
Architectural and Engineering Technicians, Technologists	1	
ARTISTIC LITERARY		
Writers and Editors	1	1
CLERICAL AND RELATED		
Stock Clerks	1	1
SALES		
Sales Clerks	1	1
PROCESSING		
Foreman: Food and Beverage	1	2
Sawmill Sawyers	1	

TABLE 9 - CONTINUED

MACHINING		
Tool and Die Making	1	
Welding and Flame Cutting	1	3
Boilermakers, Plates	1	
PRODUCT FABRICATING & ASSEMBLING		
Electrical Equipment Fabricating	1	
Cabinet and Wood Furniture Makers	1	2
Marine Craft Fabricating Assembling	1	
OTHER CRAFTS AND EQUIPMENT OPERATING		
Printing Press Occupations	1	1
TOTAL	31*	

* Firms may have indicated several occupations.

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 36B

The two major types of occupations for which employers recruit outside the Province are management and natural sciences. It is interesting to note the similarity between those occupations where there were vacancies and those where recruitment outside the Province occurred. Machining and product fabricating and assembling also posed recruitment problems for individual employers.

As well, employers indicated the occupations for which they usually hired individuals outside the firm. The following table presents the data by two digit occupation code.

TABLE 10 OCCUPATIONS FOR WHICH FIRMS USUALLY RECRUITED OUTSIDE THE FIRM

OCCUPATION	NUMBER OF FIRMS
Managerial	11
Natural Sciences	1
Clerical	7
Sales	4
Processing	19
Machining	7
Product Fabricating	4
Construction trades	4
Transport Equipment	4
Material Handling	1
Other Craft and Equipment	2
Other	3
TOTAL	67

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 36

Once again, it is apparent that managers tend to be recruited outside the firm. Those in processing occupations are also recruited from outside the firm as are some clerical and machining employees.

There are some trends in recruitment patterns which become obvious when one analyzes the patterns by occupation. The following table presents the data:

TABLE 11 OCCUPATION BY RECRUITMENT PATTERN

OCCUPATION	OUTSIDE THE PROVINCE	OUTSIDE THE FIRM	INTERNAL PROMOTION
Managerial	12	11	4
Natural Sciences	7	1	2
Artistic Literary	1	0	0
Clerical	1	7	7
Sales	1	4	7
Processing	2	19	38
Machining	3	7	17
Product Fabricating	3	4	9
Construction Trades	0	4	2
Transport Equipment	0	4	4
Material Handling	0	1	2
Other Crafts	1	2	6
Other	0	3	1
TOTAL	31	67	99

SOURCE: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 35-36

Clearly, managers and natural sciences professionals are recruited from outside the Province . Those in clerical occupations may be either recruited from outside the firm or promoted from within while sales, processing, machining and product fabricating tend to be promoted from within the firm. Most other positions are filled through internal promotion.

This completes the analysis of the employment characteristics of the firm. However, other variables can influence the total employment picture.

MANUFACTURING MARKETS AND PRODUCTION

PRIMARY MARKETS

Employers were asked the question "where are the primary markets for your products?" As one might expect the majority (66%) indicated their primary markets were in Canada.

The following table presents the number of firms by their primary markets.

TABLE 12 - PRIMARY MARKETS OF THE MANUFACTURING FIRMS

MARKET	NUMBER	PERCENTAGE	CUMULATIVE PERCENTAGE
Prince Edward Island	28	36%	36%
Atlantic Canada	14	18%	54%
Other parts of Canada	9	12%	66%
United States	4	5%	71%
North America	11	14%	85%
International Markets	11	14%	99%
	77		

Source: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change on Manufacturing: Question 11

Although the majority were competing in the national market, 33% competed internationally. This would seem to indicate that manufacturers must keep abreast of new technology if they are to remain competitive in international markets.

As well, 36% of the firms sold their products on a local basis only. Approximately 66% shipped their products within Canada. One could also argue that the 12% who shipped throughout Canada (not just Prince Edward Island or Atlantic Canada) must produce a product utilizing up to date technology if they are to be competitive with other manufacturers.

PRODUCTION LEVELS

Employers were also asked to identify changes in their production level over the past 5 years. Although the majority (63%) indicated production levels have increased, others noted their levels had decreased (9%), remained the same (20%) or fluctuated (8%). This is understandable as presumably during the recession, manufacturers would have reduced their production levels.

Employers were asked to identify the reasons for the production change. The reasons appear in the following table.

TABLE 13 REASONS FOR THE PRODUCTION CHANGE

REASON	NUMBER	PERCENTAGE
INCREASE		
Increased Marketing Effort	23	29
Increased Demand	15	19
Market Acceptance	8	10
Increased Productivity	13	17
Cheaper Raw Materials	1	1
Supply of Raw Materials	7	9
DECREASE		
Decreased Demand	9	12
High Prices for Raw Materials	2	3
TOTAL	78	

Source: Calculated from the Joint 1983 Federal-Provincial Survey of the Impact of Technological Change: Question 12.

Varied reasons were provided for the production changes. The primary reason cited for a production increase was an increased marketing effort followed by increased demand and productivity. Market acceptance, the supply and price of raw materials were other reasons identified to account for increased production.

Marketing was the major reason cited for the production increase which suggests the importance of a strategy to open new markets and increase the firm's share in existing markets.

Production declines, however, were because of decreased demand as well as higher prices for raw materials. A major cause of decreased demand was most likely the economic recession.

Employers were asked about their experiences with new technologies.

RECENT EXPERIENCES IN IMPLEMENTING NEW TECHNOLOGIES

The 78 survey companies were asked if they currently use a word processor, a computer, or had introduced any equipment within the last five years which allows them to produce their product more efficiently. This section of the questionnaire explored the benefits derived from the equipment change, and the human resource implications resulting from its introduction.

Appendix D presents a summary of the advice regarding the implementation of new technology provided by employers.

Of the seventy-eight (78) companies included in the Survey, fifteen (15) reported the installation of a computer, five (5) had acquired a word processor(s) in their offices, and thirty-one (31) stated they had installed new or improved equipment to assist in production. In total 40 of the 78 survey (51%) companies reported some form of recent technological change in their office or production facilities. Table 14 presents the survey findings on technological change by type of industry.

COMPUTERS

The Term 'computer' was used to describe a wide range of micro-electric products, from micro-computers to mainframes and Computer Aided Design/Computer Aided Manufacturing systems. Six companies reported the use of micro-computers, two reported the use of mini-systems, and four (three of which were printing or publishing establishments) were operating mainframes. This group of fifteen companies using computers of various kinds includes several of

the Island's largest manufacturing sector employers. One company with only six employees is also represented, thus size of operation would not appear to be an overriding factor in computer usage. The median number of employees for this group of fifteen companies was 47, compared to 21 for the total Survey group.

Table 14 Technological Change by Type of Establishment

	Food & Beverage Processors	Other Manufacturers	All Companies
A. New or Improved Production Equipment [1.] (Excluding Computers)	13	11	24
B. Computers [2.]	1	5	6
C. Word Processors [2.]	0	1	1
D. New Equipment & Computers (A & B)	3	2	5
E. Equipment & Word Processor (A & D)	0	0	0
F. Computer & Word Processor (B & D)	0	2	2
G. Equipment, Computer, & Word Processor (A & B & D)	0	2	2
H. No Change in Equipment of Any Type Reported	14	24	38
TOTAL	31	47	78

Summary

No. of Companies reporting new production equipment - 31
No. of Companies using computers - 15
No. of Companies using word processors - 5
No. of Companies reporting new or improved equipment - 40
Total Survey Companies - 78

1. Installed since 1978
2. Currently in use

SOURCE: Calculated from the 1983 Joint Federal/Provincial Survey on the Impact of Technological Change in the Manufacturing Industry, P.E.I. Questions 13 and 14.

The first computer to be acquired by a manufacturing company in P.E.I. (from survey group) was installed in 1967. An additional three companies acquired computers in the late 1970's, and the remaining 11 firms installed computers in or after 1980. Accounting and inventory control were the most commonly described functions of computer systems, while seven companies also used them in the actual production process, and two companies used them for product design.

WORD PROCESSORS

Only five companies (6.4% of all survey companies) reported the use of word processors in their office operations. Three of the five were printing or publishing establishments. The median employment level for these five companies was 52.

None of the five companies using word processors had experienced difficulty in finding operators. In all cases existing staff were retrained to operate the equipment, with dealer-provided training, and in one instance Institutional training utilized. In three out of the five companies repair services were provided by another firm, which in only one case was a local firm.

OTHER NEW EQUIPMENT

Survey companies were asked to describe any equipment introduced within the last five year period which enables them to produce their product more efficiently. Thirty-one of the seventy-eight companies indicated that they had introduced such equipment. The extent of the equipment changes ranged from relatively small items such as air guns for drilling and painting, to an entire new automated production line. However, in most cases the equipment described represented an improved version of an existing technology, rather than any radical change in production methods.

Of the thirty-one companies reporting the installation of new or improved equipment, 25 or 81% were Island owned and operated. Fourteen companies had opened in P.E.I. in 1970 or later, with the remaining 17 established prior to 1970. The median employment level for the group was 25, with the range from 325 employees to 3 employees per firm. (For seasonal establishments an average of peak and low employment levels was taken.) Food and beverage processing companies were well represented in this group, with 52% reporting the installation of new or improved equipment. In comparison only 32% of secondary manufacturers reported the installation of new or improved equipment.

For 25 of the 31 companies reporting the installation of new or improved equipment, maintenance and repair tasks were carried out by company employees. Of the six companies using the services of another firm for repair work, three reported that a local firm performed this function.

BENEFITS

The benefits derived from the installation of new or improved equipment were chiefly productivity related. Twenty-seven companies stated that production was faster and/or more efficient, with other factors such as improved quality control, the ability to produce new products, and a reduction in 'down-time' due to equipment malfunction also important. Only seven companies specifically mentioned experiencing labour savings, or a reduction in labour costs as a result of the equipment change. However, it is possible that such savings were also subsumed under the more common response of increased productive efficiency. Table 15 presents the data.

TABLE 15 Benefits Derived from New or Improved Equipment Acquisition

Benefits	Food & Beverage Processors	Other Manufacturers	Total*
Faster & More Efficient Production	16	11	27
Better Quality Product	4	7	11
Less Down Time for Maintenance/Repair	2	0	2
New Products Possible	0	2	2
Reduction in Labour Costs	4	3	7

Total Companies 31

*Most Companies cited more than one type of benefit.

SOURCE: Calculated from the Joint 1983 Federal/Provincial Survey on the Impact of Technological Change in Manufacturing. Question 32A.

The key question is what were the training and recruitment requirements resulting from the introduction of new technology.

TRAINING AND RECRUITMENT REQUIREMENTS

COMPUTERS

Only two of the 15 companies reporting the current use of computers had experienced problems in finding qualified staff to operate the machines. Computer operators and systems analysts were the occupations found to be in short supply by these companies. Only one company hired from outside the firm in order to meet its new skill requirements resulting from the equipment acquisition. In most cases office support staff (secretaries, clerk-typists) acquired the skills necessary for operating the new equipment, or existing managers assumed responsibility for running the new computerized production processes or office systems.

The way in which training needs generated by the new equipment were met varied from company to company and according to the type of equipment introduced. Six of the fifteen companies in this group did not indicate that any special training was required or had taken place. Dealer-provided training was the preferred method in a further five companies. A C.E.I.C. Industrial contract was used by one company to provide training for existing staff in the use of new computerized equipment. The remaining three companies encouraged staff to attend Institutional training courses provided locally. Five companies indicated that there was a need for further training for computer operators.

According to estimates provided by the fifteen companies currently using computers, an additional six computer operators will be required in 1984, and a further one in 1985.

Questions relating to the servicing and repair of computer equipment showed that while the vast majority of companies rely on someone outside the company itself for repair work, only three companies indicated that this work was undertaken by a local firm. The sale and servicing of computer equipment may be an area where there is scope for expansion within P.E.I.

OTHER NEW EQUIPMENT

For the majority of companies reporting the installation of new or improved equipment, such equipment was installed on or after 1980. Most firms did not experience any difficulty in finding qualified workers to operate the new equipment. Nine of the thirty-one companies reported such difficulties, but only six companies hired from outside the firm to meet their new skill requirements.

For those companies (25) who did not hire additional workers from outside, 16 provided some form of training in the use of the new equipment for existing staff. In-house training was the method chosen by twelve of the sixteen companies, with a further two using Dealer-provided instruction. One company entered into an Industrial Training contract with C.E.I.C. for meeting training costs, while one other company took advantage of a Quality Control program offered by the Federal Department of Fisheries & Oceans. Five of the thirty-one companies thought that more training was needed for workers affected by changes in the type of equipment used.

The estimates provided by these thirty-one companies of future manpower requirements resulting from the installation of new equipment, were as follows:

No. of additional operators needed in 1984 = 15

No. of additional operators needed in 1985 = 8

FUTURE INVESTMENT IN NEW TECHNOLOGY

The seventy-eight (78) companies in the Survey were asked if they planned to introduce new equipment within the next three years. Fifty-two companies replied in the affirmative. Table 16 presents the responses to this question by type of industry and type of equipment under consideration for purchase.

TABLE 16 Future Investment Intentions

Industry	Type of Equipment			
	Word Processor	Computer	Other	Unspecified
Food & Beverage Processors	0	1	16	1
Other Manufacturers	1	13	26	1
Total*	1	14	42	2

*Some companies listed more than one category of equipment.

SOURCE: Calculated from the Joint 1983 Federal/Provincial Survey on the Impact of Technological Change in Manufacturing. Question 31A.

One company expressed an interest in purchasing a word processor. Computers were more popular, with fourteen (14) companies stating a purchase intention. All but one of these companies were engaged in secondary manufacturing. For those companies who specified the kind of computer under consideration, four were interested in computer aided design (CAD), computer aided manufacturing (CAM), or both. One company mentioned a specific robotic device for use in the production process. For the majority of companies contemplating the purchase of new equipment however, new or improved conventional technologies were favoured over micro-electronic hardware. The "other" category includes a wide range of production equipment. New generators, a saw mill, new product molds, improved lathes, and automated equipment of various kinds are some examples. Two companies stated that they would be purchasing new equipment in order to remain competitive but could not predict what type of equipment this would be.

ESTIMATES OF FUTURE EMPLOYMENT LEVELS IN MANUFACTURING

SURVEY ESTIMATES

Employers were asked to indicate "what factors other than new technology will influence employment levels in the firm over the next five years?" The major factors which employers identified were economic conditions (30 firms), supply and demand (37) and the availability of new markets (16). Costs, government policy, competition and production change were also factors that employers thought could influence employment levels.

As one might expect, economic conditions in general and more particularly, conditions within the industry were clearly the major factor thought to influence employment levels.

Employers were also asked the following question: "Do you foresee total employment in your firm increasing over the next few years, declining or remaining the same?" Given the declines in employment caused by the recession, one might expect that most would indicate employment would increase. However, 37 firms predicted employment would remain the same, 34 thought it would increase and 3 suggested employment would decline. Thus, most employers were cautious about future employment increases perhaps because of recent economic conditions.

One of the objectives of the study was to determine employers' estimates of future employment levels in their firm. Therefore, employers were asked "What would be your best guess as to the actual number of people employed, this time next year and in the following two years?" Table 17 presents the 1983 actual, and 1984-86 forecast employment levels by industry sub-sector.

TABLE 17 Employment Levels by Industry Sub-Sector - 1983 to 1986

('Best estimates' of Survey Companies)

INDUSTRY	# SURVEY COMPANIES	# EMPLOYEES				Avg. Annual Growth Rate
		1983 [1]	1984 [2]	1985	1986	
Meat & Poultry Products	3	40	50	59	61	15.5
Fish Products	15	1,420	1,469	1,485	,492	1.7
Fruit & Vegetable Products	4	579	579	579	579	0
Dairy Products	5	292	293	296	299	0.8
Animal Feeds	2	21	21	21	21	0
Bakery Products & Beverage	2	65	71	73	74	4.5
Total Processors	31	2,417	2,483	2,513	2526	1.5
Rubber & Plastic Products	2	33	32	45	55	19.9
Leather Products, Textiles & Knitting Mills	5	107	114	119	121	4.2
Wood Industries	6	198	144	142	142	-9.6
Furniture & Fixtures	3	44	38	41	41	-1.9
Printing & Publishing	5	172	175	176	177	1.0
Metal Fabricating & Machinery	10	399	420	442	453	4.3
Ship & Boat Building	3	111	102	117	143	9.6
Electrical Products	2	26	29	32	35	10.4
Non-Metallic Mineral Products	3	103	111	120	139	10.6
Chemicals & Chemical Products	3	74	77	81	87	5.6
Miscellaneous Products	4	73	79	94	121	18.6
Other (not primarily engaged in Manufacturing)	1	38	38	38	38	0
Total Secondary Manufacturers and Ohter	47	1,378	1,359	1,447	1,552	4.1
Total Survey Companies	78	3,795	3,842	3,960	4,078	2.4

[1]For those Companies where employment fluctuates seasonally, the 'peak level was used in calculating 1983 employment levels.

[2]Three (3) Companies declined to provide estimates of future employment levels. Their 1983 levels were used for 1984-86 period.

SOURCE: Calculated from the Joint Federal/Provincial Survey on the Impact of Technological Change in Manufacturing. Question 38.

In the period 1983 to 1986 aggregate employment in the 78 companies participating in the Survey is forecast to grow by 283, representing an annual average growth rate of 2.4%. The secondary manufacturers are expecting a stronger growth rate (4.1% per annum) than processors (1.5% per annum). However, as the processing sector accounts for the majority of manufacturing jobs in P.E.I., slow growth rates for processing companies severely restricts the level of new job creation in the total sector.

Within the processing sector the Meat and Poultry Products sub-group expressed the greatest degree of optimism concerning future employment growth. This was largely due to an expectation on the part of one company that they would expand to fill the vacuum left from the partial closure of the Canada Packers plant in Charlottetown in the fall of 1983. Such expectations have not materialized, and the employment growth rate of 15.5% for this group will only be possible if an alternate facility is established once the existing Canada Packers plant ceases operations in 1984. The largest group of companies in the processing sub-sector, 'fish products', anticipates an annual average growth rate of 1.7%. The permanent re-establishment of the Georgetown Seafoods Plant in P.E.I. would improve this picture, but only if there was no decline in fish stocks available to other Island plants, causing a reduction in operations elsewhere. Future employment in Fruit and Vegetable products processing is not available as as the largest employer in this group declined to provide future estimates.

Growth rates within the secondary manufacturing group vary considerably. The average annual growth rates for those sub-sectors range from 19.9% (Rubber & Plastic Products) to -9.6% (Wood Industries). In secondary manufacturing technological change is a more significant factor in determining future employment levels than in processing, although its impact upon employment levels would presently more

appear to be minimal in all but a minority of companies. Over the next few years this situation may change. As production becomes increasingly automated and micro-electronic applications more widespread, labour inputs may decline in importance. However, the positive growth rates forecast by the survey Companies in this group would also indicate that efficiencies realized through technological change of any description are expected to be accompanied by an expansion of operations. Overall employment growth is therefore likely to outpace the rate of decline due to technological innovations in the short term.

EMPLOYMENT ESTIMATES FOR THE MANUFACTURING SECTOR

In the summer of 1983, the survey companies represented approximately 75% of total employment in Manufacturing in P.E.I. While Food and Beverage processors were slightly under represented in the Survey, and Secondary Manufacturing slightly over represented, the forecast employment growth rate can be applied to the total Industry sector with some degree of confidence. Figure 1 shows employment levels in Manufacturing in P.E.I. from 1977 to 1983, and projects these trends forward to 1986 according to the growth rate calculated from the Survey employment estimates.

The forecast of Manufacturing sector employment in P.E.I. presented in Table 18 shows slow but steady employment growth to 1986. This does not however, take into account any increase or decrease in employment levels caused by the opening of new companies, or the closure of existing plants. While the survey companies in total regained and exceeded their pre-recession employment levels (see table 3), plant closures in 1981 and 1982 have decreased overall employment for the sector. Based on the forecast growth rate obtained from the survey companies, a return to pre-recession employment levels in the

Manufacturing Sector as a whole is not to be expected within the next three years. The combination of a slow recovery in the national economy, and the realization of productivity gains through more efficient production methods will most likely continue to dampen employment growth in this sector to 1986 and beyond.

FIGURE 1 EMPLOYMENT IN MANUFACTURING - P.E.I. - 1977-1986

SOURCE: Statistics Canada, Labour Force Survey, CAT #71-001
Projections based on forecast growth rates from 1983 Survey.

HUMAN RESOURCE DEVELOPMENT ISSUES

TECHNOLOGICAL CHANGE

One of the assumptions which the Survey was designed to test was that changes in the technology used by manufacturing companies would result in changes in the actual work performed. This in turn could lead employers to seek workers with different skills than those traditionally present in the company's workforce. The early identification of such trends is important from a training perspective due to the lead time necessary for developing and implementing appropriate programs to ensure an adequate supply of skilled labour.

Of the 78 companies in the 1983 Survey, 52 (67%), indicated that they would be installing new equipment over the next three year period. Table 18 presents in summary form the expected human resource implications of their future investment plans.

Not all the prospective equipment changes were expected to affect the companies' labour requirements. However, 31 of the 52 firms (60%) contemplating equipment purchases thought that this would have an impact on employment within the firm. When asked to list those occupations likely to be affected by the equipment changes, secretaries, fish canners and packers, fruit and vegetable canners, and sawmill sawyers were mentioned by two or more companies. Other occupations cited were milk processors, textile machine operators, carpenters, and draughtsmen.

TABLE 18 HUMAN RESOURCE IMPLICATIONS OF FUTURE EQUIPMENT PURCHASES

	Number of Companies			
	Processors	Secondary Manufacturers	Total*	As% of all Survey Companies
Planning to introduce New Equipment within next 3 years	18	34	52	66.7
				As% All Companies planning to introduce New Equipment
Anticipating changes in employment levels resulting from the introduction of new equipment	11	20	31	59.6
Anticipating a change in skill requirements creating a need for				
a) Re-Training	9	13	22	42.3
b) New-Hiring	5	8	13	25.0
Anticipating that jobs will be lost due to the introduction of new equipment	0	2	2	3.8

*Some companies are represented in more than one 'implications' category.

SOURCE: Calculated from the Joint Federal/Provincial Survey on the Impact of Technological Change in Manufacturing. Questions.

The need for retraining or new hiring as a result of changes in production and office technology was mentioned by 26 of the 52 companies planning to install new equipment. The majority of companies in this group indicated that their production line workers would require re-training. Other occupational areas where a re-training need was identified were:-

Electricians
Office Staff
Electronic Technicians
Loom Operators
Machinists
Sawyers
Engineers
Designers

The 52 companies planning to introduce new equipment within the next three years were asked if workers with different skills would be hired. Thirteen (13) of the fifty-two (52) companies thought this likely. The occupations listed as in future demand were as follows:-

Electronics
Marketing Manager
Chemical Technicians
Computer Programmers
Draughtspersons
Designers
Cabinet Makers
Sheet Metal Workers
Meat Cutters
Planers
Sewing Machine Operators
Food & Beverage Processors
Engineering Technologists and Technicians
Production Line-Quality Control Personnel
Repairpersons - Electronic Equipment
Sawyers

Only two companies thought that plans for the introduction of new equipment would result in job losses. The occupations at risk in those two cases were carpenters and construction labourers.

OCCUPATIONS IN PRESENT OR FUTURE DEMAND

Technological change is not the only factor which can alter the pattern of occupational demand. An expansion of existing operations, the development of new product lines requiring different techniques, or the establishment of new companies would result in an increased demand for labour which may also vary in its occupational mix from the current profile of manufacturing sector jobs. However, in P.E.I. where approximately 12% of the labour force are unemployed, supply problems are only to be expected in those areas where the skills required are relatively new (to P.E.I.), and not usually to be found in the Island's labour force. It is for this reason that technogical change is significant in determining the occupational content of future demand.

The relatively modest employment growth rate forecast for the Manufacturing sector (see figure 1) means that while vacancies will arise through growth and attrition there will be no dramatic increase in job vacancies over the next few years (except through the start-up of new operations). However, the occupational requirements of the industry may well change over time due to new technologies or other factors, while some occupational skills may already be in short supply. Table 19 compiles the Survey information on 'shortage' occupations from various sections of the questionnaire.

TABLE 19 Occupations in Present or Future Demand

(skilled or semi-skilled only)

Occupations	Number of Companies Reporting: -				
	1 Turnover	2 Job Vacancies	3 Out of Province Hiring	4 New Hiring Anticipated	5 Skills In Future Demand
Management Occupations	-	1	12	1	-
Chemists	1	-	-	1	1
Industrial Engineers	-	-	2	-	-
Mechanical Engineers	-	-	1	-	-
Physical Science Technologists & Technicians	-	1	-	-	-
Draughting	-	2	2	1	-
Architectual & Engineering Technologists & Technicians	-	-	1	2	4
Systems Analysts	-	-	-	1	1
Writers	-	-	1	-	2
EDP Equipment Operator					
Inspectors - Food & Beverage Processing	1	-	-	-	-
Glaziers	-	1	-	-	-
Tool & Die Makers	-	-	1	-	2

Occupations in Present or Future Demand

(skilled or semi-skilled only)

Table 19 (cont.)

Occupations	Number of Companies Reporting: -				
	1 Turnover	2 Job Vacancies	3 Out of Province Hiring	4 New Hiring Anticipated	5 Skills In Future Demand
Machinists	-	-	-	-	5
Sheet Metal Workers	-	-	-	1	-
Welding	-	1	1	-	2
Boiler Makers	-	-	1	-	-
Electrical Equipment, Installing & Repairing	1	-	-	1	-
Electronic Equipment Fabricating	1	-	1	-	-
Cabinet Makers	-	-	1	1	1
Marine Craft Fabricating & Assembling	-	1	1	-	1
Printing Press Occupations	-	1	1	-	-

NOTE:

1. Turnover - from Question 33
'Over the past 12 months has turnover (people leaving as a result of quitting or being fired) been a problem in your establishment?'

2. Job Vacancies - from Question 34
'During the week of July 4 - July 8, 1983, did you have any jobs open?'

3. Out of Province Hiring - from Question 36B
'What positions in your firm do you usually fill by hiring outside the Province?'

4. New Hiring Anticipated - from Question 31G
'Will workers with different skills be hired?'
(as a result of future changes in technology).

5. Skills in future demand - from Question 40
'What kind of skills will you be looking for in your employees in the future'.

Several trends are readily apparent from the data presented in table 19. Firstly, out-of-province recruitment is concentrated in Management Occupations. The small size of the manufacturing sector in P.E.I. inevitably means that the search for experienced Managers will be conducted off-Island in many instances. However only twelve (12) of the seventy-eight (78) survey companies reported that they normally hire managers out-of-province and a far greater number hire within the province or the firm. Given that 15% of the managers are hired out of province, additional management training could be beneficial.

Secondly, specialized professional or technical areas are well represented in the demand indicators. Chemists, Inspectors - food and beverage processing, and Printing press occupations are examples. However the number of trained/experienced people in these occupations in P.E.I. is very small, and the requirement due to normal turnover or attrition usually too slight to merit the establishment of an institutional training capacity on-Island.

Thirdly, occupations relating to new technologies feature quite strongly in the demand indicators, especially the last two categories relating to future demand. Architectural and Engineering Technologists and Technicians (which includes electronic technicians), Electronic Data Processing equipment operators, draughting, and electronic equipment fabricating occupations would appear to be in present and future demand. While numbers are only available for reporting companies, not jobs, and the extent of this demand cannot be calculated from the available data, it would appear that the Engineering Technologist and Technician category in particular will experience strong growth over the next few years.

Fourthly, more traditional skilled manufacturing sector occupations such as machinists, tool and die makers, sheet metal workers, welders, cabinet makers, and ship and boat building occupations will continue to be important, with many companies anticipating increases in occupational demand. Machinists were mentioned by five (5) companies as in future demand.

In addition to the specific occupational areas identified as in demand, the Survey respondants also indicated broad skill areas which are becoming increasingly important. In the processing sector, quality control in the care and processing of fish was mentioned by several firms. In secondary manufacturing, a frequent comment was the need for current and future workers to have a good understanding of computerized machines, or in the words of one responding company 'some high tech. acceptance'.

SUMMARY AND CONCLUSIONS

The major trends identified from the 1983 Survey of Manufacturing Companies in relation to occupational demand were as follows:

1. Total employment will grow slowly over the next three years, with considerable variations in growth rates between different manufacturing sub-sectors. In general, stronger growth is anticipated in the secondary manufacturing sector where the workforce tends to be more skilled and diversified, than in the processing sector.

2. Technological change was found to play a relatively minor role in affecting the overall demand for labour in the P.E.I. Manufacturing Sector. More traditional factors such as market conditions, the cost and supply of raw materials, and subsequent business decisions to expand or contract the number and range of products produced were of much greater importance. For the majority of companies reporting the installation of new or improved equipment the change did not substantially alter the kind of work performed.

3. A minority interest was identified in micro-electronic applications in the production process. In such situations the company's occupational profile was likely to change, with a reduced requirement for production line workers and an increased requirement for skilled technicians, technologists, and operators.

4. While some instances of job losses were reported as a result of the application of new and improved technologies, there is little evidence of substantial lay-offs. Most of the new equipment introduced in recent years did not represent a radical departure from equipment formerly in use, requiring only that the skills possessed by the companies' present workforce be adapted or enhanced. In many instances it would appear that job losses relating to increased technogical efficiency were compensated by additional labour requirements resulting from an overall expansion of operations. This may also be due to the timing of the Survey. In the summer of 1983 most companies were experiencing an upswing in production as the economy moved into the recovery phase.

5. A considerable number of survey respondants indicated that on-the-job training was the most appropriate response to their current or future skill requirements. There were two main reasons for this. Firstly, for the majority of companies (and almost all food processors) the new equipment introduced or under consideration for purchase did not represent any radical change from the equipment formally in use. The requisite new skills could therefore be easily acquired on site. The second reason relates to the diversity and small size of the secondary manufacturing sector in P.E.I. In many cases the skills needed in one company are not transferable to others because no other firms on the Island are producing a similar product in a similar manner. On-the-job training for new or existing employees is therefore the most appropriate training method given the unique or company - specific nature of the skills, and the small numbers of workers required.

APPENDIX 'A'

TECHNOLOGICAL CHANGE - A JOINT FEDERAL/PROVINCIAL STUDY

P.E.I. DEPT. OF LABOUR - CANADA EMPLOYMENT & IMMIGRATION COMMISSION

INTERVIEWER: _____ INTERVIEWEE: _____

DATE: _____ TIME STARTED: _____ TIME COMPLETED: _____

The P.E.I. Department of Labour and the Canada Employment and Immigration Commission are conducting a survey to determine the impact of technological change on employment in the manufacturing sectors. Seventy-five firms are included in the study. The interview will take approximately 30 minutes to one hour. The objectives of the survey are to determine the impact of technological change on current employment levels, and to obtain information on future employment trends.

INTERVIEWER COMMENTS: _____ OFFICE CODING ONLY

_____

_____

_____

_____

_____

BACKGROUND INFORMATION ON THE FIRM

1. IS THIS THE CORRECT NAME OF YOUR FIRM? Interviewer write in the name prior to the interview. Read out the name).

_____ 001

2. IS YOUR CORRECT MAILING ADDRESS THE FOLLOWING? Interviewer, write in the address prior to the interview. Read out the address).

_____

_____ 002

3. WHAT YEAR DID THIS FIRM OPEN ON P.E.I.? Interviewer regardless of whether or not the firm name has changed.

_____ 003

4. IS THIS ESTABLISHMENT USUALLY OPEN YEAR ROUND?

YES ☐ 1 NO ☐ 2 004

Go to Question 6.

5.(A) WHAT MONTHS DOES YOUR FIRM OPEN? _____ 005

(B) WHAT MONTH DOES YOUR FIRM CLOSE? _____ 006

6. IS THE HEAD OFFICE OF YOUR FIRM LOCATED ON PRINCE EDWARD ISLAND?

YES ☐ 1 NO ☐ 2

7.(A) DOES EMPLOYMENT IN YOUR FIRM FLUCTUATE ON A SEASONAL BASIS? CODES

YES ☐ 1 NO ☐ 2

(If 'Yes') (If 'No')

(B) HOW MANY PEOPLE DO YOU EXPECT TO HAVE EMPLOYED IN THE PEAK MONTH AND LOWEST MONTH THIS YEAR?

PEAK MONTH ☐☐ 1983 ____ 009 010

LOW MONTH ☐☐ 1983 ____ 011 012

(C) HOW MANY PEOPLE DO YOU EXPECT TO HAVE EMPLOYED, ON AVERAGE THIS YEAR?

1983 _____ 013

8.(A) WHAT WERE YOUR APPROXIMATE EMPLOYMENT LEVELS AT PEAK AND LOW MONTHS OVER THE LAST FOUR YEARS? (If figures are not available discuss general trends. Both full and part-time employees are to be included)

	Peak Month	Low Month
1979		
1980	014	
1981		
1982		
		021

(B) APPROXIMATELY HOW MANY PEOPLE WERE EMPLOYED IN EACH YEAR FOR THE PAST FOUR YEARS? (If figures are not available discuss general trends. Both full and part-time employees are to be included.)

1979 _____
1980 _____
1981 _____
1982 _____ 023

9. WHAT JOBS ARE INVOLVED IN THE PRODUCTION OF YOUR FIRM'S PRODUCTS? (Interviewer, prompt on the number employed for each of the jobs and the duties if not obvious .

JOBS/DUTIES	CODE	NUMBER CURRENTLY EMPLOYED
1.	026	027
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		

	JOBS/DUTIES	CCDO	NUMBER CURRENTLY EMPLOYED
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

07

10. ACCORDING TO THE MARKET DEVELOPMENT CENTRE'S TRADE DIRECTORY, YOUR FIRM PRODUCES THE FOLLOWING PRODUCTS, ARE THESE CORRECT? (Interviewer write in the list of products prior to the interview and then read them off making the necessary changes .

	PRODUCT	STANDARD INDUSTRIAL CLASSIFICATION
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

085

11. WHERE ARE THE PRIMARY MARKETS FOR YOUR PRODUCTS?

086

12.(A) HAS YOUR LEVEL OF PRODUCTION CHANGED OVER THE PAST 5 YEARS?

INCREASED ☐1 DECREASED ☐2 REMAINED THE SAME ☐3

(B) WHAT ARE THE REASONS FOR THE CHANGE?

_____

_____

_____

_____ R1 ☐ 088

_____ R2 ☐ 089

_____ R3 ☐ 090

_____

_____

CURRENT TECHNOLOGY

13. DOES YOUR FIRM CURRENTLY USE:

a) a word processor ☐1 Yes ☐2 No 091

If yes, administer word processor module. Question 15

b) a computer ☐1 Yes ☐2 No 091

If yes, administer computer module. Question 18A

14. MORE SOPHISTICATED MACHINERY IS BECOMING AVAILABLE TO ASSIST IN THE MANUFACTURING OF A PRODUCT. DURING THE LAST 5 YEARS, HAS YOUR FIRM INTRODUCED ANY EQUIPMENT THAT ALLOWS YOU TO PRODUCE YOUR PRODUCT(S) MORE EFFICIENTLY?

☐1 Yes ☐2 No 093
(Go to Q31a).

21. WHAT IS THE NAME OF THE PIECE(S) OF EQUIPMENT YOU HAVE INTRODUCED? (Interviewer: the generic name not the brand name. The name is to be inserted in each blank in the following questions . We are interested in equipment which has a significant employment impact).

a) _____ EQ1 ☐ 123

b) _____ EQ2 ☐ 124

c) _____ EQ3 ☐ 125

22.(A) HOW DOES THE _____ (Insert name of machinery) IMPROVE YOUR FIRM'S ABILITY TO PRODUCE YOUR PRODUCTS?

_____

_____

_____

_____

_____

_____

_____ IMP☐ 12

_____

(B) WHAT YEAR WAS THE _____ INSTALLED? 12

23.(A) HAVE YOU HAD ANY PROBLEMS FINDING A QUALIFIED PERSON TO OPERATE THE _____?

☐1 Yes ☐2 No 128

(B) DID YOU HIRE A PERSON FROM OUTSIDE THE FIRM TO OPERATE THE _____?

☐1 Yes ☐2 No 129

Go to 23F.

(C) WHAT OCCUPATION WAS THE PERSON EMPLOYED IN PRIOR TO THE INTRODUCTION OF THE _____?

_____

OCCP

☐☐☐

130

(D) WERE THERE ANY TRAINING PROGRAMS AVAILABLE TO ASSIST IN RETRAINING THE EMPLOYEE?

☐1 Yes ☐2 No 131

Go to 23F.

(E) WHAT PROGRAMS DID YOU USE?

_____

_____

_____ PR1 ☐ 13

_____ PR2 ☐ 13

_____

23.(F) IS THERE A NEED FOR MORE TRAINING FOR _____?

☐1 Yes ☐2 No 134

(G) HOW MANY ADDITIONAL _____ WILL YOUR FIRM REQUIRE IN

1984 _____ 135 1985 _____ 136?

24.(A) DOES SOMEONE WITHIN YOUR FIRM USUALLY REPAIR YOUR _____?

☐1 Yes ☐2 No

Go to 25. 137

(B) DOES A LOCAL FIRM USUALLY REPAIR YOUR _____?

☐1 Yes ☐2 No 138

(If more than one major new equipment item was introduced, use additional NEW EQUIPMENT modules as required. Otherwise continue on).

FUTURE TECHNOLOGICAL CHANGE

31.(A) DO YOU PLAN TO INTRODUCE NEW EQUIPMENT WITHIN THE NEXT 5 YEARS?

☐1 Yes ☐2 No

Go to Question 32(A). 161

(B) WHAT EQUIPMENT DO YOU PLAN TO INTRODUCE?

_____

_____

_____ EQU1 ☐ 164

_____ EQU2 ☐ 165

_____ EQU3 ☐ 166

(C) WILL THE INTRODUCTION OF THE EQUIPMENT IMPACT ON EMPLOYMENT?

☐1 Yes ☐2 No ☐3 Don't Know 167

Go to Question 32(A).

(D) WHICH OCCUPATIONS WILL BE AFFECTED?

_____

_____

_____ 01 ☐☐☐ 168

_____ 02 ☐☐☐ 169

_____ 03 ☐☐☐ 170

_____ 04 ☐☐☐ 171

31.(E) WILL RETRAINING OF YOUR WORKERS BE REQUIRED?

☐1 Yes ☐2 No 172
Go to Question 31(G).

(F) IN WHICH OCCUPATIONS?

_____ R01 ☐☐☐ 173
_____ R02 ☐☐☐ 174
_____ R03 ☐☐☐ 175
_____ R04 ☐☐☐ 176

(G) WILL WORKERS WITH DIFFERENT SKILLS BE HIRED?

☐1 Yes ☐2 No 177
Go to Question 32(a)

(H) WHICH SPECIFIC SKILLS WILL BE IN DEMAND?

_____ SK1 ☐☐☐ 178
_____ SK2 ☐☐☐ 179
_____ SK3 ☐☐☐ 180

32.ARE THERE ANY JOBS THAT MIGHT DISAPPEAR? WHICH ONES?

_____ DIS1 ☐☐☐ 231
_____ DIS2 ☐☐☐ 232
_____ DIS3 ☐☐☐ 233

TURNOVER AND VACANCY EXPERIENCES

33. (A) OVER THE PAST 12 MONTHS, HAS TURNOVER (PEOPLE LEAVING AS A RESULT OF QUITTING OR BEING FIRED) BEEN A PROBLEM IN YOUR ESTABLISHMENT?

☐$_1$ Yes ☐$_2$ No 184

Go to Question 34.

(B) IF YES, IN WHAT JOBS IS TURNOVER A PROBLEM?

a) _____ TUR1 _____ 185

b) _____ TUR2 _____ 186

c) _____ TUR3 _____ 187

34. (A) DURING THE WEEK OF JULY 4 - JULY 8TH, 1983, DID YOU HAVE ANY JOBS OPEN?

☐$_1$ Yes ☐$_2$ No 188

Go to Question 35.

(B) IF YES, WHAT JOBS WERE OPEN?

a) _____ VAC1 _____ 189

b) _____ VAC2 _____ 190

c) _____ VAC3 _____ 191

35. WHAT POSITIONS IN YOUR FIRM DO YOU USUALLY FILL THROUGH INTERNAL PROMOTION?

_____

_____ PRO1 _____ 192

_____ PRO2 _____ 193

_____ PRO3 _____ 194

36. WHAT POSITIONS IN YOUR FIRM DO YOU USUALLY FILL BY HIRING OUTSIDE THE FIRM?

_____

_____ EXT1 _____ 195

_____ EXT2 _____ 196

_____ EXT3 _____ 197

(B) WHAT POSITIONS IN YOUR FIRM DO YOU USUALLY FILL BY HIRING OUTSIDE THE PROVINCE?

_____ PRO1 _____ 198

_____ PRO2 _____ 199

_____ PRO3 _____ 200

_____

FUTURE EMPLOYMENT

37. WHAT FACTORS OTHER THAN NEW TECHNOLOGY WILL INFLUENCE EMPLOYMENT LEVELS IN YOUR FIRM OVER THE NEXT 5 YEARS?

_____

_____

_____ FAC1 ☐ 201

_____ FAC2 ☐ 202

_____ FAC3 ☐ 203

38.(A) DO YOU FORESEE TOTAL EMPLOYMENT IN THE FIRM INCREASING OVER THE NEXT FEW YEARS, DECLINING, OR REMAINING THE SAME?

Increase ☐1 Decline ☐2 Remain the same ☐3 204

(B) WHAT WOULD BE YOUR BEST GUESS AS TO THE ACTUAL NUMBER OF PEOPLE EMPLOYED, THIS TIME NEXT YEAR AND IN THE FOLLOWING TWO YEARS?

1984 ____
1985 ____
1986 ____ 207

39.(A) WILL THE KIND OF WORK ACTUALLY PERFORMED CHANGE OVER THE NEXT 5 YEARS?

☐1 Yes ☐2 No 208

(B) IF YES, HOW WILL IT CHANGE?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ CH1 ☐ 209

_____ CH2 ☐ 210

40. WHAT KIND OF SKILLS WILL YOU BE LOOKING FOR IN YOUR EMPLOYEES IN THE FUTURE?

(Interviewer: Ask the question only if firm has experience with the new technologies.)

41. IF YOU COULD GIVE ADVICE TO OTHER COMPANIES CONSIDERING THE INTRODUCTION OF NEW TECHNOLOGIES, WHAT WOULD IT BE?

41.

ADV ☐ 214

ANY OTHER COMMENTS:

COM ☐ 215

THANK YOU VERY MUCH FOR YOUR COOPERATION AND ASSISTANCE! A COPY OF THE REPORT WILL BE SENT TO YOU IN THE FALL.

WORD PROCESSOR

15. WHAT YEAR WAS THE FIRST WORD PROCESSOR INSTALLED IN YOUR FIRM?

_____ 094

16. (A) HAVE YOU HAD ANY PROBLEMS FINDING A QUALIFIED PERSON TO OPERATE THE WORD PROCESSOR?

☐1 Yes ☐2 No 095

(B) DID YOU HIRE A PERSON FROM OUTSIDE THE FIRM TO OPERATE THE WORD PROCESSOR?

☐1 Yes ☐2 No 096

Go to 16F

(C) WHAT OCCUPATION WAS THE PERSON EMPLOYED IN PRIOR TO THE INTRODUCTION OF THE WORD PROCESSOR?

_____

_____ WOP ☐☐☐ 09

_____

(D) WERE THERE ANY TRAINING PROGRAMS AVAILABLE TO ASSIST IN RETRAINING THE EMPLOYEE?

☐1 Yes ☐2 No

Go to Question 16 F

(E) WHAT PROGRAMS DID YOU USE?

_____

_____

_____ [illegible] ☐ [illegible]

_____ [illegible] ☐ [illegible]

(F) IS THERE A NEED FOR MORE TRAINING FOR WORD PROCESSOR OPERATORS?

☐1 Yes ☐2 No [illegible]

(G) HOW MANY ADDITIONAL WORD PROCESSING OPERATORS WILL YOUR FIRM REQUIRE IN

1984 _____ 1985 _____?
102 103

17.(A) **DOES SOMEONE WITHIN YOUR FIRM USUALLY REPAIR YOUR WORD PROCESSING EQUIPMENT?**

☐ 1 Yes ☐ 2 No

Go to 18 104

(B) **DOES A LOCAL FIRM USUALLY REPAIR YOUR WORD PROCESSING EQUIPMENT?**

☐ 1 Yes ☐ 2 No 105

COMPUTER

18. (A) WHAT YEAR WAS THE FIRST COMPUTER INSTALLED? _____ 106

(B) WHAT TYPE OF COMPUTER IS IT? _____ COM ☐☐ 107

(C) WHAT IS THE COMPUTER USED FOR? _____

_____

_____ US1 ☐ 108

19. (A) HAVE YOU HAD ANY PROBLEMS FINDING A QUALIFIED PERSON TO OPERATE THE COMPUTER? US2 ☐ 109

☐ 1 YES ☐ 2 NO 111 US3 ☐ 110

(B) IF YES, WHAT SPECIFIC SKILLS ARE DIFFICULT TO FIND?

_____

_____

_____

_____ SK1 ☐☐☐ 112

_____

(C) DID YOU HIRE A PERSON FROM OUTSIDE THE FIRM TO OPERATE THE COMPUTER?

☐ 1 YES ☐ 2 NO 113

Go to 19G

(D) WHAT OCCUPATION WAS THE PERSON EMPLOYED IN PRIOR TO THE INTRODUCTION OF THE COMPUTER?

_____

_____

_____ POCC ☐☐☐ 114

(E) WERE THERE ANY TRAINING PROGRAMS AVAILABLE TO ASSIST IN RETRAINING THE EMPLOYEE?

☐ 1 YES ☐ 2 NO 115

Go to 19G

(F) WHAT PROGRAMS DID YOU USE?

_____

_____

_____

_____ PG1 ☐ 116

PG2 ☐ 117

(G) IS THERE A NEED FOR MORE TRAINING FOR COMPUTER OPERATORS?

☐ 1 YES ☐ 2 NO 118

(H) HOW MANY ADDITIONAL COMPUTER OPERATORS WILL YOUR FIRM REQUIRE IN

1984 _____ (119) 1985 _____ (120)?

20. (A) DOES SOMEONE WITHIN YOUR FIRM USUALLY REPAIR YOUR COMPUTER?

☐ 1 YES ☐ 2 NO 121

(B) DOES A LOCAL FIRM USUALLY REPAIR YOUR COMPUTER?

☐ 1 YES ☐ 2 NO 122

2nd PIECE OF EQUIPMENT

25. WHAT YEAR DID YOU INSTALL THE _____? 139

26. (A) HAVE YOU HAD ANY PROBLEMS FINDING A QUALIFIED PERSON TO OPERATE THE _____?

☐1 YES ☐2 NO 140

(B) DID YOU HIRE A PERSON FROM OUTSIDE THE FIRM TO OPERATE THE _____?

☐1 YES ☐2 NO 141

(C) WHAT OCCUPATION WAS THE PERSON EMPLOYED IN PRIOR TO THE INTRODUCTION OF THE _____? OCP ☐☐☐ 142

(D) WERE THERE ANY TRAINING PROGRAMS AVAILABLE TO ASSIST IN RETRAINING THE EMPLOYEE?

☐1 YES ☐2 NO 143

(E) WHAT PROGRAMS DID YOU USE?

_____

_____

_____ PRG ☐ 144

_____ PRG ☐ 145

_____

(F) IS THERE A NEED FOR MORE TRAINING FOR _____?

☐1 YES ☐2 NO 146

(G) HOW MANY ADDITIONAL _____ WILL YOUR FIRM REQUIRE IN

1984 ____ 147 1985 ____ 148?

27. (A) DOES SOMEONE WITHIN YOUR FIRM USUALLY REPAIR YOUR _____?

☐1 YES ☐2 NO 149

(B) DOES A LOCAL FIRM USUALLY REPAIR YOUR _____?

☐1 YES ☐2 NO 150

THIRD PIECE OF EQUIPMENT

28. WHAT YEAR DID YOU INSTALL THE _____? 151

29.(A) HAVE YOU HAD ANY PROBLEMS FINDING A QUALIFIED PERSON TO OPERATE _____?

☐1 YES ☐2 NO 152

(B) DID YOU HIRE A PERSON FROM OUTSIDE THE FIRM TO OPERATE THE _____?

☐1 YES ☐2 NO 153

(C) WHAT OCCUPATION WAS THE PERSON EMPLOYED IN PRIOR TO THE INTRODUCTION OF THE _____?

_____

_____ WOP ☐☐☐ 154

_____

(D) WERE THERE ANY TRAINING PROGRAMS AVAILABLE TO ASSIST IN RETRAINING THE EMPLOYEE?

☐1 YES ☐2 NO 155

(E) WHAT PROGRAMS DID YOU USE?

_____

_____ TP1 ☐☐ 156

_____ TP2 ☐☐ 157

_____

(F) IS THERE A NEED FOR MORE TRAINING FOR _____?

☐1 YES ☐2 NO 158

(G) HOW MANY ADDITIONAL _____ WILL YOUR FIRM REQUIRE IN

1984 ____ (159) 1985 ____ (160)?

30.(A) DOES SOMEONE WITHIN YOUR FIRM USUALLY REPAIR YOUR _____?

☐1 YES ☐2 NO 161

Go to 18

(B) DOES A LOCAL FIRM USUALLY REPAIR YOUR _____?

☐1 YES ☐2 NO 162

APPENDIX 'B'

LIST OF COMPANIES VISITED

Acadian's Fisherman's Co-op Association
Amalgamated Dairies Ltd.
Atlantic Fish Specialities
Atlantic Specialized Industries
Bagnalls Mills Ltd.
Benner Industries Ltd.
Boates (P.E.I.) Limited
British Wollen Knitters (Canada)
Campbell & Burns Div. of Avon Food
Campbell's Concrete Ltd.
Cavendish Farms
Charlottetown Metal Products Ltd.
Corrigans Welding & Wood Stove
Curran & Briggs Ltd.
DeBlois Likely Limited
Diagnostic Chemical Ltd.
Eastern Converters
Excel Optical Ltd.
French River Canning Ltd.
Georgetown Packers Ltd.
Georgetown Shipyard Inc.
Hall & Stavart Ltd.
Health Pasteurized Milk Company
Heritage Mills Inc.
Hutt Bros. Ltd.
Imapro
Irwin Printing Company Ltd.
Island Control Limited
Island Fertilizers Ltd.
Island Fiberglass Industries Ltd.
Island Meat Packers Ltd.
Island Metal Fabricators
Island Offset Inc.
Island Press Ltd.
Jack's Quality Meats Inc.
Jenkin's Feed Service Ltd.
Johnston's (1977) Ltd.
Johnston's Home Style Products Ltd.
Journal Publishing Co. Ltd.
Keeping & MacKay Ltd.
Kitchen Cabinet Centre Ltd.
Livingston, Ben and Sons Ltd.
M. F. Schurman Co. Ltd.
MacAusland's Woolen Mills Ltd.
Maple Leaf Dairy (1973) Ltd.
McAskill Woodworking Limited
M & S Metal Works Limited
National Sea Products Ltd.
North Rustico Fisherman's Co-op
North Shore Packing Co. Ltd.
Northumberland Chemicals
P.E.I. Produce Ltd.
Paderno Inc.
Perfection Foods
Phillips Feed Service Ltd.
Polar Seafoods Ltd.
Prebuilt Structures Limited
Preci-Tech Ltd.
Precision Products & Services
Prince Edward Island Bag Co. Ltd.
Provincial Construction Co. Ltd.
Purity Dairy Ltd.
Schurman Enterprises
Seaman's Beverages Ltd.
Signcraft Inc.
Souris Seafoods Ltd.
Stretch Brothers Ltd.
The Bake Shop
The Guardian Patriot
Tignish Co-Operative Association
Tignish Fisheries Co-op Assoc.
Tip Top Truss Ltd.
UMF
Usen Fisheries Ltd.
Vere Beck and Son Ltd.
Waddells Poultry Farm
William Condon & Sons
Wood Corporation

APPENDIX C

Detailed Occupational Profile of Survey Companies

	OCCUPATION	NUMBER EMPLOYED
1130	General Managers and Other Senior Officials	33
1131	Management Occupations: Natural Sciences, Engineering and Mathematics	2
1135	Financial Management Occupations	2
1137	Sales and Advertising Management Occupations	11
1141	Purchasing Management Occupations	1
1143	Production Management Occupations	50
1145	Management Occupations, Construction Operations	8
1147	Management Occupations, Transport and Communications Operations	6
1149	Other Managers and Administrators, n.e.c.	13
1171	Accountants, Auditors and Other Financial Officers	9
1175	Purchasing Officers and Buyers, Except Wholesale and Retail Trade	11
2117	Physical Sciences Technologists and Technicians	1
2119	Occupations in Physical Sciences, n.e.c.	9
2133	Biologists and Related Scientists	1
2143	Civil Engineers	1
2144	Electrical Engineers	1
2145	Industrial Engineers	1
2147	Mechanical Engineers	5
2163	Draughtsmen	10
2165	Architectural and Engineering Technologists and Technicians	9
2181	Mathematicians, Statisticians and Actuaries	2
2177		3
3314	Advertising and Illustrating Artists	3
3319	Occupations in Fine and Commercial Art, Photography and Related Fields n.e.c.	3

APPENDIX C (cont'd.)

	OCCUPATION	NUMBER
3351	Writers and Editors, Publication	35
4111	Secretaries and Stenographers	22
4113	Typists and Clerk-Typists	18
4131	Bookkeepers and Accounting Clerks	9
4133	Tellers and Cashiers	5
4141	Office Machine Operators	1
4143	Electronic Data-Processing Equipment Operators	3
4150	Supervisors; Material Recording, Scheduling and Distributing Occupations	1
4153	Shipping and Receiving Clerks	15
4155	Stock Clerks and Related Occupations	1
4157	Weighers	1
4169	Library, File and Correspondence Clerks and Related Occupations, n.e.c.	3
4171	Receptionists and Information Clerks	1
4177	Messengers	7
4179	Reception, Information, Mail and Message Distribution Occupations, n.e.c.	2
4191	Collectors	2
4197	General Office Clerks	84
5130	Supervisors: Sales Occupations, Commodities	2
5131	Technical Salesmen and Related Advisors	5
5133	Commerical Travellers	15
5135	Salesmen and Salesperson, Commodities, n.e.c.	2
5137	Sales Clerks, Commodities	41
5149	Sales Occupations, Commodities, n.e.c.	1
5174	Advertising Salesmen	3
5177	Business Services Salesmen	2
5191	Buyers, Wholesale and Retail Trade	1
5193	Driver-Salesmen	28
5199	Other Sales Occupations, n.e.c.	3
6191	Janitors, Charworkers and Cleaners	3
7131	Farm Management Occupations	2
7183	Field Crop and Vegetable Growing Workers	20

APPENDIX C (cont'd.)

	OCCUPATION	NUMBER
7198	Occupations in Labouring and Other Elemental Work: Farming, Horticulture and Animal Husbandry	12
7319	Fishing, Hunting, Trapping and Related Occupations, n.e.c.	10
8131	Metal Smelting, Converting and Refining Furnacemen	2
8137	Moulding, Coremaking and Metal Casting Occupations	7
8148	Occupations in Labouring and Other Elemental Work, Metal Processing	20
8160	Foremen: Chemicals, Petroleum, Rubber, Plastic and Related Materials Processing Occupations	1
8167	Roasting, Cooking and Drying Occupations, Chemicals and Related Materials	5
8178	Occupations in Labouring and Other Elemental Work: Chemicals, Petroleum, Rubber, Plastic and Related Materials Processing	7
8179	Chemicals, Petroleum, Rubber, Plastic and Related Materials Processing Occupations, n.e.c.	5
8210	Foremen: Food, Beverage and Related Processing Occupations	22
8211	Flour and Grain Milling Occupations	6
8213	Baking, Confectionery Making and Related Occupations	6
8215	Slaughtering and Meat Cutting, Canning, Curing and Packing Occupations	14
8217	Fish Canning, Curing and Packing Occupations	881
8221	Fruit and Vegetable Canning, Preserving and Packing Occupations	57
8223	Milk Processing and Related Occupations	83
8226	Inspecting, Testing, Grading and Sampling Occupations: Food, Beverage and Related Processing	22
8227	Beverage Processing Occupations	17
8228	Occupations in Labouring and Other Elemental Work: Food, Beverage and Related Processing	87
8229	Food., Beverage and Related Processing Occupations n.e.c.	6
8230	Foremen: Wood Processing Occupations, Except Paper Pulp	4
8231	Sawmill Sawyers and Related Occupations	1

APPENDIX C (cont'd.)

	OCCUPATIONS	NUMBER
8235	Wood Treating Occupations	2
8238	Occupations in Labouring and Other Elemental Work: Wood Processing, Except Paper Pulp	2
8239	Wood Processing Occupations, Except Paper Pulp, n.e.c.	4
8261	Textile Fibre Preparing Occupations	1
8263	Textile Spinning and Twisting Occupations	2
8265	Textile Winding and Reeling Occupations	1
8267	Textile Weaving Occupations	1
8271	Knitting Occupations	4
8278	Occupations in Labouring and Other Elemental Work, Textile Processing	16
8279	Textile Processing Occupations, n.e.c.	4
8310	Foremen, Metal Machining Occupations	8
8311	Tool and Die-Making Occupations	2
8313	Machine-Tool Operating Occupations	26
8319	Metal Machining Occupations, n.e.c.	1
8333	Sheet-Metal Workers	9
8334	Metalworking-Machine Operators, n.e.c.	30
8335	Welding and Flame Cutting Occupations	85
8337	Boilermakers, Platers and Structural-Metal Workers	12
8339	Metal Shaping and Forming Occupations, Except Machining, n.e.c.	20
8353	Wood Sawing and Related Occupations, Except Sawmill	6
8355	Planing, Turning, Shaping and Related Wood Machining Occupations	22
8359	Wood Machining Occupations, n.e.c.	5
8373	Abrading and Polishing Occupations: Clay, Glass, Stone and Related Materials	2
8393	Filing, Grinding, Buffing, Cleaning and Polishing Occupations, n.e.c.	29
8395	Patternmakers and Mouldmakers, n.e.c.	

APPENDIX "C" (cont'd.)

	OCCUPATION	NUMBER
8598	Occupations in Labouring and Other Elemental Work: Product Fabricating, Assembling and Repairing, n.e.c.	59
8599	Other Product Fabricating, Assembling and Repairing Occupations, n.e.c.	27
8711	Excavating, Grading and Related Occupations	65
8719	Excavating, Grading, Paving and Related Occupations, n.e.c.	2
8733	Construction Electricians and Repairmen	10
8781	Carpenters and Related Occupations	21
8785	Painters, Paperhangers and Related Occupations	5
8795	Glaziers	5
8798	Occupations in Labouring and Other Elemental Work, Other Construction Trades	110
8799	Other Construction Trades Occupations, n.e.c.	13
9175	Truck Drivers	63
9179	Motor Transport Operating Occupations, n.e.c.	4
9199	Other Transport and Related Equipment Operating Occupations, n.e.c.	4
9310	Foremen: Material-Handling and Related Occupations, n.e.c.	1
9311	Hoisting Occupations, n.e.c.	1
9315	Material-Handling Equipment Operators, n.e.c.	3
9317	Packaging Occupations, n.e.c.	7
9318	Occupations in Labouring and Other Elemental Work, Material-Handling, n.e.c.	53
9510	Foremen, Printing and Related Occupations	2
9511	Typesetting and Composing Occupations	18
9512	Printing Press Occupations	19
9514	Printing-Engraving, Except Photoengraving Occupations	10
9515	Photoengraving and Related Occupations	2
9517	Bookbinding and Related Occupations	5
9518	Occupations in Labouring and Other Elemental Work, Printing and Related Activities	6

APPENDIX "C" (cont'd.)

	OCCUPATION	NUMBER
9599	Miscellaneous Crafts and Equipment Operating Occupations, n.e.c.	1

Appendix D Advice on the Implementation of New Technologies

The Survey respondants with experience in the implementation of new technologies were asked what advice they would give to others considering its introduction. The responses to this question are summarized below.

- Your going to have to get involved, the sooner the better. Even if its only a word processor for accounting.
- The main thing is to leave yourself enough time to train people who are not familiar with such things as computers. Unforeseen things are bound to happen during start-up of the computer system.
- The biggest thing is familiarity - know how to use it in needed applications. Avoid intimidation. The gradual introduction of new technology over time will have positive effects, and help allay people's initial fears.
- Technology is dynamic, ever changing and people have an inate ability to adapt to change. Fears can be easily overcome if the introduction is done properly.
- If you don't keep up with the latest equipment available, your competitor will, and you'll be out of business.
- Get good advice from an expert in the field as to whether the computer is necessary.
- Have the dealer or manufacturer suit you with the right machines. Make sure you will be able to use the machine effectively and frequently.
- Computer control is essential. The age of robotics is fast approaching.
- 1. Decide what you want the computer to do
  2. Develop a model of computer uses, put it down on paper
  3. Check on software availability
  4. Make certain you can get servicing
  5. Tell computer services what you want, don't let them tell you they can sell you
- Take your time
- Advance slowly, changes can bring headaches for a long time
- Aim to be as highly automated as possible and the least labour intensive
- Make sure the hardware fits your needs, and is going to be cost-effective
- Chose the right people for the right jobs.

- Ask whether your market warrants the costs involved.
- Find out how it works in other companies. Don't rely on second hand information from brochures.
- Stay with what you have and work on efficiency, quality, and cost control.
- Consider slow, easy steps. Don't go too big too fast.
- Budget properly. Too much money on equipment can lead to problems.

POOR

QUALITY

ORIGINAL